

REMARKS

Favorable reconsideration, reexamination, and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks.

Objection to the Information Disclosure Statement ("IDS")

In the Office Action, at page 2, the IDS filed August 21, 2000, was objected to, and two Japanese patent documents were not considered. Applicants respectfully request reconsideration of this objection.

M.P.E.P. § 609, A(3), at page 600-101 (7th ed., Rev. 1, Feb. 2000) states:

Where the information listed is not in the English language, but was cited in a search report or other action by a foreign patent office in a counterpart foreign application, the requirement for a concise explanation of relevance can be satisfied by submitting an English-language version of the search report or action which indicates the degree of relevance found by the foreign office. This may be an explanation of which portion of the reference is particularly relevant, to which claims it applies, or merely an "X", "Y", or "A" indication on a search report.

With the August 21st IDS, Applicants filed a copy of a European Search Report from a corresponding European patent application, which Search Report cited the two accused documents and alleged a level of relevancy using the traditional letter designations.

Applicants respectfully submit that, in accordance with M.P.E.P. § 609, the IDS fully complied with 37 C.F.R. §§ 1.97, 1.98, and that the Search Report satisfied 37 C.F.R. § 1.98(a)(3)(i).

Applicants respectfully request consideration of the documents, and return to Applicants of an examiner-initialed form PTO-892 or PTO-1449, indicating the same.

Objection to the Claims

In the Office Action, at page 2, Claims 11 and 26-34 were objected to as allegedly failing to further limit the subject matter of a previous claim. Applicants respectfully request reconsideration of this objection.

By way of the foregoing amendments, Applicants have amended Claims 11 and 26-34 to address the concerns in the Office Action. Specifically, Claims 11 and 26-34 have been amended to effect a minor editorial change to emphasize the subject matters recited therein by reciting that the plasticating unit comprises means for continuous plastication of the resin during all the period of the molding cycle. Claims 11 and 26-34 recite structural elements in combination with the claims from which they each depend, and therefore properly further limit the subject matters of the claims from which they depend. Applicants respectfully submit that Claims 11 and 26-34 are not objectionable, and therefore respectfully request withdrawal of the objections thereto.

Rejection under 35 U.S.C. § 112, Second Paragraph

In the Office Action, at page 3, Claims 21-25 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicants respectfully request reconsideration of these rejections.

Applicants and the undersigned have carefully reviewed the Office Action, the remarks therein concerning the clarity of the claims, and all of the pending claims. By way of the foregoing amendments, Applicants have attempted to specifically address each of the comments in the Office Action concerning the claims' clarity. Specifically, Claims 21-25 have been canceled, rendering their rejections moot. Applicants note that Claim 10 recites the same subcombination of elements as Claims 21-25, and depends from Claim 3. Thus, cancellation of Claims 21-25 is not a disclaimer of the subject matters thereof, as the subject matter is recited in pending Claim 10.

Applicants respectfully submit that all of the pending claims fully comply with 35 U.S.C. § 112, second paragraph. Applicants therefore respectfully request withdrawal of the rejections of the claims.

Rejection under 35 U.S.C. § 102

In the Office Action, Claims 1-3, 11, 13, 26, and 27 were rejected under 35 U.S.C. § 102(b) as reciting subject matter which is allegedly identically disclosed in U.S. Patent No. 3,674,401, issued to Annis, Jr., et al. ("Annis"), for the reasons presented in the paragraphs on pages 4-5. Applicants respectfully request reconsideration of these rejections.

The present application relates to a thermoplastic resin injection molding machine. As described in greater detail in the present specification, certain aspects of which are illustrated in the accompanying drawing figures, a plastication unit B and a buffer unit C are both connected to a passage 12. The passage 12 then leads to an injecting unit A.

According to other aspects of the invention, the top of a screw of the plastication unit defines the buffering chamber, and a pressure sensor is mounted to detect a resin pressure in the buffering chamber, which can give an accurate measurement of the pressure in the resin buffering chamber for better control of the process.

Claim 1 relates to a thermoplastic resin injection molding machine having a combination of elements including, inter alia, a plasticating unit for plasticating a thermoplastic resin, an injecting unit connected to the plasticating unit through a connecting passage to inject the plasticated resin into a mold, and a buffering unit provided in said connecting passage.

Claim 3 relates to an injection molding machine having a combination of elements including, inter alia, a pressure sensor positioned to detect a resin pressure in a buffering chamber, and resin-pressure controlling means for controlling energizing means based on the pressure detected by the pressure sensor so that the resin pressure in the buffering chamber is kept substantially constant.

The prior art, including *Annis*, fails to identically disclose or describe such combinations.

Annis describes, in the embodiment illustrated in Figure 2, an injection molding device which includes a screw plasticator 6, hopper 8, and a fluid pressure driven piston 16 which moves the screw 6 longitudinally to inject material into the mold. In an embodiment illustrated in Figure 3, the screw 6 leads to a pump 50 having a piston 52 which rides in a cylinder (unlabeled) driven by a piston rod 54. In the embodiment illustrated in Figure 3, the material passes directly from the chamber 4 in which the screw 6 is positioned, through

a passage 12, and into the pump chamber 51. The pump 50 then pushes the material through passage 18 to the mold.

Annis does not identically disclose or describe the subject matters of Claims 1-3, 11, 13, 26, and 27. More specifically, *Annis* does not describe an injection molding machine as recited in the combinations of these claims, in which an injecting unit is connected to a plasticating unit through a connecting passage to inject the plasticated resin into a mold, and a buffering unit is provided in this connecting passage. Nor does *Annis* describe a pressure sensor. Instead, *Annis* describes a machine in which a pump is interposed between a plastication screw and the machine outlet, and therefore *Annis'* machine does not include either a buffering unit fluidly positioned, or a pressure sensor, as recited in the combinations of the claims. Thus, *Annis* does not anticipate the claims under 35 U.S.C. § 102(b).

For at least the foregoing reasons, Applicants respectfully submit that the prior art fails to identically disclose or describe the subject matters recited in each of Claims 1-3, 11, 13, 26, and 27. Accordingly, Applicant respectfully submits that *Annis* fails to anticipate Claims 1-3, 11, 13, 26, and 27, and therefore respectfully requests withdrawal of the rejections thereof.

Rejection under 35 U.S.C. § 103

In the Office Action, beginning at page 7, Claims 4-10, 12, 14-25, and 28-34 were rejected under 35 U.S.C. § 103(a) as reciting subject matter which is allegedly obvious, and therefore allegedly unpatentable, over several hypothetical combinations. Specifically, the following rejections were levied:

- (1) Claims 4-7, ~~12~~, 14, 28-31: *Annis* in view of U.S. Patent No. 5,098,267, issued to Cheng, for the reasons appearing on pages 7-8;
- (2) Claims 9, ~~10~~, 33, and 34: *Annis* in view of U.S. Patent No. 6,109,909, issued to Morita, for the reasons appearing on pages 8-10;
- (3) Claims ~~8, 15, and 32~~: *Annis* and *Cheng*, in view of U.S. Patent No. 5,002,717, issued to Taniguchi, for the reasons appearing on pages 10-11;
- (4) Claims 16-19, and 21-24: *Annis* and *Cheng*, in view of *Morita*, for the reasons appearing on pages 12-13; and
- (5) Claims 20 and 25: *Annis*, *Cheng*, and *Taniguchi*, in view of *Morita*, for the reasons appearing on pages 13-14.

Applicants respectfully request reconsideration of these rejections.

Cheng describes an injection molding device which includes a spring 18 mounted in a fixed housing 20; the spring permits the plunger 12 to reciprocate in the barrel 10.

Morita describes an injection molding apparatus. A screw device 14 includes a screw 12 which feeds plasticized material to a rotary valve 82. A first heating and injection cylinder 16 and a second heating and injection cylinder 20 are in communication with the rotary valve 82 through flow passages 76 and 78, respectively. The rotary valve

82 includes three passages: a first connecting passage 92, a second connecting passage 94, and a diametral connecting passage 96. When the rotary valve 82 is in the orientation illustrated in Figure 2, the rotary valve fluidly connects the screw 12 with the first cylinder 16 via passage 92 to drive the first cylinder back and fill it's chamber with heated resin, while the second cylinder 20 is in fluid communication through passage 94 with the outlet bore 55 and injects heated resin to the mold 30. When the rotary valve 82 is in the orientation illustrated in Figure 3, the rotary valve fluidly connects the screw 12 with the second cylinder 20 via passage 94 to drive the second cylinder back and fill it's chamber with heated resin, while the first cylinder 16 is in fluid communication through passage 92 with the outlet bore 55 and injects heated resin to the mold 30. According to *Morita* at column 12, lines 1-30, position sensors (not illustrated) are provided which sense the positions of the first and second plungers 18, 22. The plungers 18, 22 are reciprocated so that a volume of resin greater than the shot volume is in each cylinder, and the resin that remains after each injection shot is transferred to the other cylinder through diametral passage 96.

Taniguchi describes an injection molding device which includes a heated cylinder 1 in which a screw 2 is positioned. A hydraulic pressure control system 16, 17 reciprocates the screw in the cylinder, and pressure sensors 18, 19 provide pressure feedback signals to a controller 13. The sensor 19 detects the fluid pressure in the hydraulic drive unit 11.

None of *Cheng*, *Morita*, and *Taniguchi* make up for the deficiencies of *Annis* with respect to the pending claims, and therefore even if properly combined without the benefit of an impermissible hindsight reconstruction of the combinations of the pending claims, the

resulting hypothetical constructs would still not include each and every element recited in the combinations of the pending claims. With reference to *Taniguchi*, which describes a pressure sensor 19, this pressure sensor measures pressure in the hydraulic control system and does not relate to a pressure of resin in a buffering chamber as recited in the claim.

For at least the foregoing reasons, Applicants respectfully submits that Claims 4-10, 12, 14-25, and 28-34, each taken as a whole, patentably defines over the prior art. Applicants therefore respectfully request withdrawal of the rejections of Claims 4-10, 12, 14-25, and 28-34 under 35 U.S.C. § 103(a).

Conclusion

For at least the foregoing reasons, Applicants respectfully submit that the present patent application is in condition for allowance. An early indication of the allowability of the present patent application is therefore respectfully solicited.

If Mr. Heckenberg believes that a telephone conference with the undersigned would expedite passage of the present patent application to issue, he is invited to call on the number below.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By:

A handwritten signature in black ink, appearing to read 'Adam J. Cermak', is written over a horizontal line.

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1 3. (Amended) An injection molding machine comprising:
2 a plasticating unit for plasticating a thermoplastic resin, and an injecting unit
3 connected to the plasticating unit through a connecting passage to inject the plasticated
4 resin into a mold,
5 said plasticating unit comprising a cylinder, a screw rotatable and movable
6 in the axial direction in the cylinder, means for rotation-driving the screw, a buffering
7 chamber defined by the top portion of the screw and the cylinder to reserve the plasticated
8 resin in an amount at least equal to the injection quantity of the resin per shot, and means
9 of energizing the screw forward in the axial direction to feed the resin in the buffering
10 chamber into the injecting unit;
11 a pressure sensor positioned to detect a resin pressure in said buffering
12 chamber, and resin-pressure controlling means for controlling said energizing means based
13 on the pressure detected by the pressure sensor so that the resin pressure in the buffering
14 chamber is kept substantially constant.

1 11. (Twice Amended) A thermoplastic resin injection molding machine as
2 claimed in claim 1, [in which] wherein the plasticating unit [carries out the] comprises
3 means for continuous plastication of the resin [continuously] during all the period of the
4 molding cycle.

1 26. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 2, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 27. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 3, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 28. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 4, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 29. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 5, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 30. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 6, [in which] wherein the plasticating unit [carries out the] comprises means for

**Marked-up Copies of
Amended Claims**

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3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 31. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 7, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 32. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 8, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 33. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 9, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.

1 34. (Amended) A thermoplastic resin injection molding machine as claimed in
2 claim 10, [in which] wherein the plasticating unit [carries out the] comprises means for
3 continuous plastication of the resin [continuously] during all the period of the molding
4 cycle.